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A New Zoogonid Trematode from Boarfish of Southern Japan¹⁾

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Abstract A trematode, *Parasteganoderma cephaloporum* gen. et sp. n. (Zoogonidae, Lepidophyllinae), was found in the upper intestine and pyloric caeca of a boarfish, *Antigonia capros*, in Japanese waters. Remarkable characteristics are an acetabulum divided into two chambers, an oral sucker split anteriorly into seven lobes and provided dorsally with a pore, and eggs surrounded by two circular bands.

During a survey of parasites of deep-sea fishes in Japanese waters, a zoogonid species of unknown genus was detected from a boarfish, *Antigonia capros*. The new genus and species are described herein.

Living trematodes were fixed with AFA under coverglass pressure, stained with Heidenhain's hematoxylin and mounted in balsam. Additional specimens were preserved in 70% ethanol, of which three specimens were sectioned serially, stained with Mayer's hematoxylin and eosin, and mounted in balsam. Two specimens were dehydrated by serial ethanol, critical point dried, coated with gold and observed with a SEM (JEOL T-220). Specimens are deposited in the collection of the National Science Museum, Tokyo (NSMT).

Parasteganoderma gen. n.

Zoogonidae, Lepidophyllinae. Body fusiform, thick, widest at postacetabular level. Cuticle spinose. Oral sucker funnel-shaped, divided anteriorly into seven lobes. Dorsal and dorsolateral lobes with mouth edge at their anterior tips. The other portion of the oral sucker lying free in a cavity. A pore opening just dorsal to the mouth, adjoining a gap behind the dorsal lobe of the oral sucker. Prepharynx short. Pharynx subglobular. Esophagus long. Caeca reaching to testes. Acetabulum large, deep, anterior to equator; the lumen divided into two chambers

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by a longitudinal wall. Testes slightly diagonal in the anterior middle of the hindbody. Cirrus pouch situated transversely and sometimes in a slightly S-shaped position; containing convoluted seminal vesicle, pars prostatica with prostatic cells, and ejaculatory duct. Genital atrium short, surrounded by glandular cells. Genital pore on left body margin, immediately postbifurcal level. Ovary ovoid, dextral, in anterior hindbody. Laurer's canal and seminal receptacle present. Uterus occupied much of hindbody; metraterm narrow. Eggs with two circular bands. Vitelline follicles in lateral groups, situated between acetabulum and testes. Excretory vesicle tubular; pore terminal. Intestinal parasites of marine teleosts.

Type species: *Parasteganoderma cephaloporum* sp. n.

***Parasteganoderma cephaloporum* sp. n.**

(Figs. 1–10)

Host. *Antigonia capros* LOWE (Antigoniidae).

Site. Upper intestine and pyloric caeca.

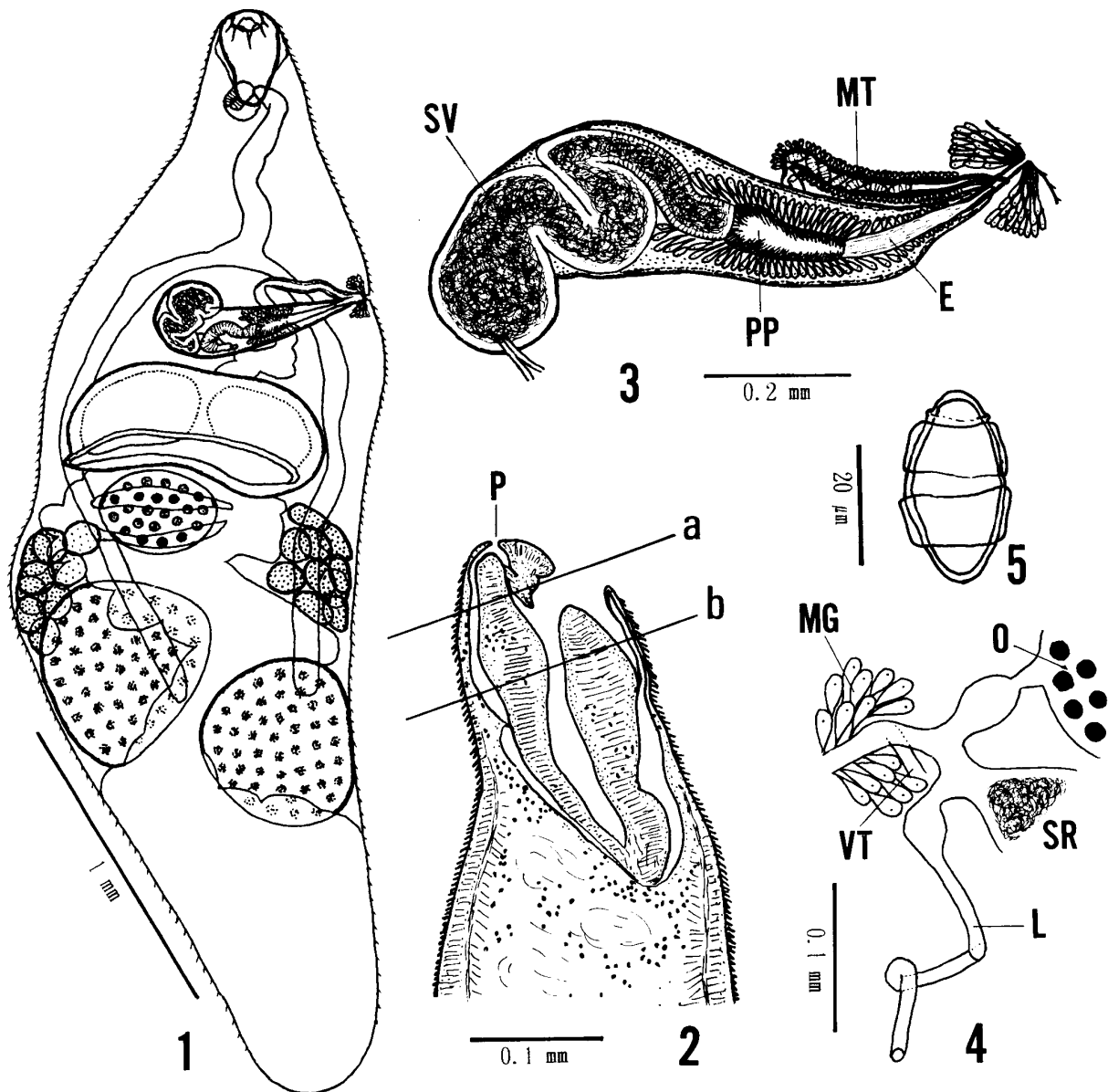
Locality. Off Kôchi Prefecture, Pacific coast of southern Japan.

Date. 26–VIII–1988.

Specimen No. NSMT-P1 3466.

Description. Based on 14 whole mounts and 3 sectioned specimens. Body fusiform, thick, 3.3–4.2 mm long, tapering anteriorly and rounded posteriorly, with maximum width of 0.90–1.15 mm at postacetabular level. Cuticle spinose. Oral sucker funnel-shaped, $0.24\text{--}0.29 \times 0.17\text{--}0.21$ mm, divided anteriorly into seven lobes; two ventral, four lateral and one dorsal. Dorsal and dorsolateral lobes with mouth edge at their anterior tips. Other portions of the oral sucker lying free in a cavity. A pore opening just dorsal to the mouth, adjoining a gap behind the dorsal lobe of the oral sucker. The gap joined posteriorly with buccal cavity. Prepharynx short, up to 0.14 mm long, with longitudinal muscle bundles; pharynx subglobular, $64\text{--}119 \times 59\text{--}101$ μm ; esophagus 0.38–0.75 mm long, with longitudinal muscle bundles, bifurcating near midlevel of forebody; caeca terminating in testicular zone. Acetabulum large, wider than long, $0.29\text{--}0.42 \times 0.67\text{--}0.95$ mm; the orifice is reddish in color in life; the lumen divided into two chambers by a longitudinal wall; both chambers deep, reaching near dorsal body margin. Forebody 35–43% of body length. Sucker ratio 1: 3.5–4.8.

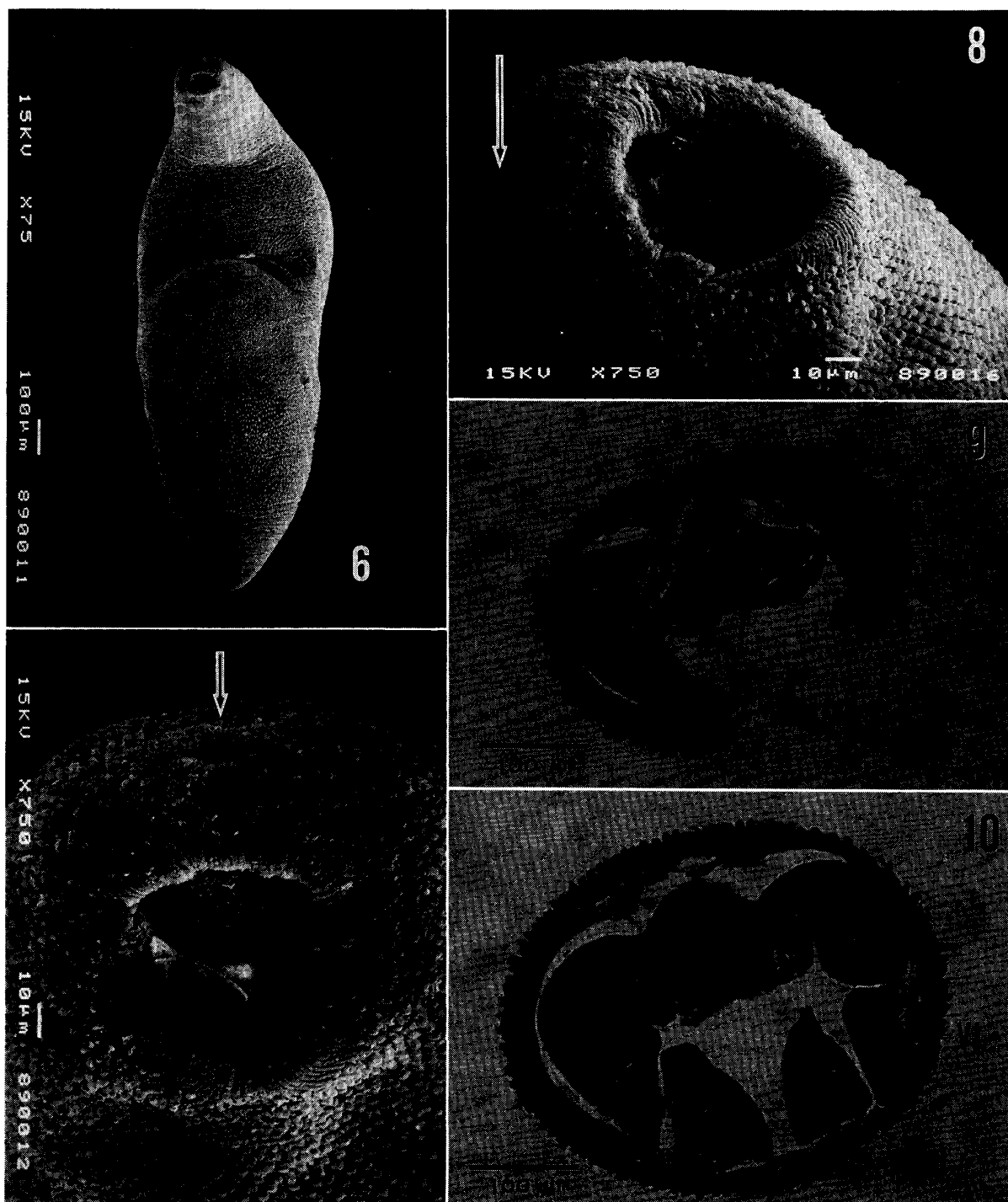
Testes ovoid to triangular, slightly diagonal, close to lateral body margin; the right $0.25\text{--}0.60 \times 0.40\text{--}0.72$ mm and the left $0.27\text{--}0.55 \times 0.36\text{--}0.61$ mm. Posttesticular space 24–31% of body length. Vas efferens not united with each other. Cirrus pouch situated transversely and sometimes in a slightly S-shaped position, starting from anterior margin of acetabulum and going across left intestine in the ventral side to reach to left body margin; containing convoluted seminal vesicle with distal portion tubular and enclosed in thin circular muscle; pars prostatica 0.09–0.18 mm long; prostatic cells and ejaculatory duct 0.07–0.15 mm long. Genital atrium very



Figs. 1–5. *Parasteganoderma cephaloporum* gen. et sp. n. — 1. Entire worm, ventral view. 2. Diagrammatic sagittal section through oral sucker. For lines a & b, refer to Figs. 9 & 10. 3. Terminal genitalia, ventral view. 4. Ovarian complex, dorsal view. 5. Egg. E, ejaculatory duct; L, Laurer's canal; MG, Mehlis' gland; MT, metraterm; O, ovary; P, pore; PP, pars prostatica; SR, seminal receptacle; SV, seminal vesicle; VT, vitelline duct.

short, surrounded by glandular cells. Genital pore at left margin of body, at level of slightly posterior to caecal bifurcation.

Ovary transversely ovoid, $0.21\text{--}0.28 \times 0.30\text{--}0.42$ mm, dextral, just posterior to or partially dorsal to acetabulum. Seminal receptacle $0.12\text{--}0.15 \times 0.23\text{--}0.32$ mm, touching posterior margin of ovary. Laurer's canal opening dorsally a little posterior to ovary. Vitelline follicles in lateral groups, 9–10 on each side, between acetabulum



Figs. 6–8. SEM micrographs of *Parasteganoderma cephaloporum* gen. et sp. n. and Figs. 9–10. Optical micrographs of the same species. — 6. Entire worm, ventral view. 7. Anterior end of worm, showing mouth and pore (arrow), ventral view. 8. Ditto, lateral view. 9. Transverse section through oral sucker at a level of “a” shown in Fig. 2. 10. Ditto, at a level of “b” shown in Fig. 2. D, dorsal lobe; DL, dorsolateral lobe; M, mouth; V, ventral lobe; VL, ventrolateral lobe.

and testes. Uterus occupied much of hindbody, ascending dorsal to acetabulum. Metraterm narrow, $0.22\text{--}0.33 \times 0.02\text{--}0.06$ mm, covered with thin coat of glandular cells. Eggs elliptical, $32\text{--}36 \times 17\text{--}20$ μm , with two thin circular bands, each 6–8 μm wide. Excretory vesicle tubular, not reaching testes; pore terminal.

Discussion. BRAY (1987a) divided the family Zoogonidae into two subfamilies, Zoogoninae and Lepidophyllinae, on the basis of the distribution of vitellaria and the nature of egg-capsules. The zoogonines have eggs with membranous or weakly tanned capsules, and either vitellaria in one or two masses or several follicles which are not divided into clusters, in the median field of the body, whereas the lepidophyllines have eggs with strongly tanned capsules, and vitellaria in paired fields of follicles. The present new genus belongs to the Lepidophyllinae in these regards.

According to BRAY (1987b), the Lepidophyllinae contains twelve genera, of which three genera, *Proctophantastes* ODHNER, 1911, *Neosteganoderma* BYRD, 1964 and *Steganodermatoides* PARUKHIN et LYADOV, 1979, have acetabula divided equatorially, but no genera have acetabula separated transversely. The present new genus is distinguishable by an acetabulum divided into two chambers by a longitudinal wall, an oral sucker split anteriorly into seven lobes and provided dorsally with a pore, and eggs surrounded by two circular bands.

A pore just behind the mouth was overlooked until made evident under SEM observation. The transverse sections revealed the pore to adjoin a gap behind the dorsal lobe of oral sucker. The gap joins posteriorly with a buccal cavity. The pore is an organ of unknown function, but probably related to the seven split lobes of the oral sucker. It appears to control the movement of the split lobes, and/or to supplement egestion.

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